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INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR  
CS21003 Algorithms I: Third Class Test 2021 Spring

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Date of Examination: 20-th March 2021

Duration: 35 minutes + 5 minutes (for scanning, concatenating, and uploading)

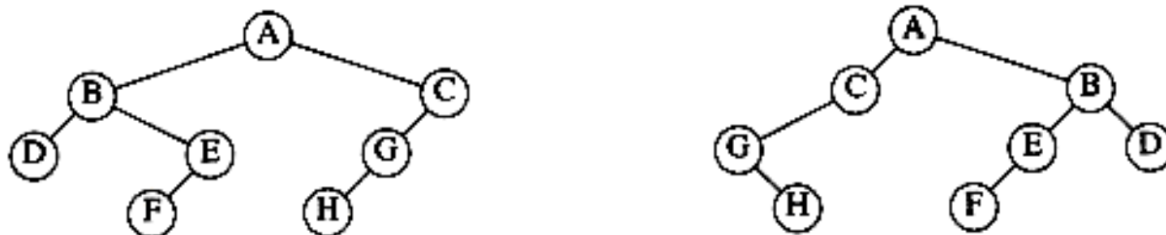
Full Marks: 10

Subject: CS21003 Algorithms I

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**Part I**

We call two binary trees  $T_1$  and  $T_2$  “twins” of each other if  $T_1$  can be converted into  $T_2$  by swapping the left and right children of some of the nodes in  $T_1$ . The figure below shows two binary trees which are twins of each other.



Each node of a binary tree contains an integer data field called “key”, and two pointers, namely “left” and “right”, to its left and right children.

1. Design an algorithm to check if two given binary trees are twins of each other.
2. Analyze the running time of your algorithm (there exists a linear time algorithm).

[7+3 Marks]

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*All the best*

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